

U. S. DEPARTMENT OF AGRICULTURE.

REPORT
OF
THE POMOLOGIST
FOR
1899.

BY
G. B. BRACKETT.

[FROM THE REPORT OF THE SECRETARY OF AGRICULTURE.]



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REPORT OF THE POMOLOGIST.

U. S. DEPARTMENT OF AGRICULTURE,
DIVISION OF POMOLOGY,
Washington, D. C., September 1, 1899.

SIR: I have the honor to transmit herewith a report of the operations of the Division of Pomology for the fiscal year ending June 30, 1899, together with a brief outline of the work of the current year, and a statement of proposed plans and estimates recommended for the fiscal year 1901.

Respectfully,

G. B. BRACKETT,
Pomologist.

Hon. JAMES WILSON, *Secretary.*

WORK OF THE YEAR.

ROUTINE WORK.

As in former years, the routine work which devolves upon this Division has been very heavy. The number of specimens received exceeded those of the previous year.

About 350 fruit descriptions, 200 water-color paintings, 100 photographic negatives, 125 wax models, and over 800 mounted herbarium sheets have been added to the collections.

The regular correspondence has been heavy, and a large correspondence relating to the preparation of horticultural exhibits for the Paris Exposition of 1900 has been conducted without any increase in the clerical force of the Division. Attention to the details of the exposition work has involved some interference with the regular work, but it is believed to be justified in view of the importance of having our rapidly increasing horticultural industries adequately represented at Paris.

DISTRIBUTION OF TREES, SCIONS, CUTTINGS, PLANTS, AND SEEDS.

Through cooperative work with the Section of Seed and Plant Introduction the distribution of promising varieties and species of fruit-bearing trees, plants, and vines has been largely increased. During the year nearly 2,700 lots of such have been placed with about 275 official and private experimenters in the various portions of the country. This distribution embraced nearly 350 varieties, which represented 58 species and 20 recognized hybrids.

Among the most important species in addition to the European grapes were a line of high repute from the interior of Chile, secured through the activity and interest of Hon. Joseph W. Merriam, consul at

Iquique, and a reputed hardy type of Aguacate or Avocado, "Alligator pear" (*Persea gratissima*), from Coahuila, Mexico. The fruit last named is imported from the West Indies in considerable and increasing quantities, being sold in the Eastern seaboard cities at high prices. For many years there has been a small production of the fruit in Florida, but since the great freeze of 1894-95 it has, in consequence of the susceptibility of the tree to injury by cold, been limited to the extreme southern portion of the east coast and the adjacent keys. In 1893, as noted in the report of the Assistant Pomologist for that year (p. 284), a few seeds of a Mexican type of the species, which is reputed to be more hardy, were secured and distributed, and since that time efforts have been made to obtain a sufficient quantity for a more general distribution. During the year arrangements were made by which, through the courtesy of our consul-general at Monterey, Mexico, Hon. J. K. Pollard, about 2,000 seeds of the desired type were secured in fine condition. These were at once distributed to 86 persons in Florida, Louisiana, Texas, Arizona, and California, a considerable quantity being reserved for planting in the greenhouse here. Numerous reports received concerning these seeds, as well as the large percentage of germination here, indicate that the type may now be considered as sufficiently introduced to be given a thorough test under widely varying conditions of soil and climate in the subtropical portions of the country.

The labor, both clerical and manual, growing out of the handling and distributing of so large a number of plants has been a serious tax upon the time and energy of the employees of the Division.

With the improved equipment in the shape of a storage cellar and packing room provided by the Section of Seed and Plant Introduction it is expected that similar work in future can be done to better advantage.

Careful records are kept of all plants distributed in this way, and our effort is to encourage accurate experimental work on the part of competent fruit growers, from whom valuable data for public information on the adaptability of varieties and species to their localities may be expected in the future.

EXPERIMENTS WITH EUROPEAN GRAPES IN THE SOUTH ATLANTIC STATES.

As noted in the last report, an investigation of the status of the efforts to grow European table grapes in the South Atlantic States was undertaken in cooperation with the Section of Seed and Plant Introduction. In this investigation the Assistant Pomologist visited a number of places in North Carolina, Georgia, and Florida, where efforts of this kind are under way, with a view to determining the advisability of undertaking systematic experiments looking toward the introduction of the culture of the choice table varieties of Europe in that region. As is well known, nearly all the attempts to introduce and maintain these varieties in the past have resulted in failure and death of the vines within a few years. For upward of two centuries the failure was charged to various causes, which may briefly be summarized under the designation "supposed unfavorable soil and climatic conditions." After the discovery, about 1870, that the great destruction of European vines in France was due to *Phylloxera*, it was for a time supposed by entomologists and many grape growers that the failure of the European grape in Eastern America was largely, if not

wholly, due to that cause. More recent investigation has made apparent the fact, however, that fungous diseases affecting leaf and fruit have played an important part in the destruction of vines of this type in the Eastern United States.

The superior flavor and quality of the fruit of the choicer varieties of the European grape, together with the growing demand for fruit products of high quality in our markets, seems to render the effort to introduce them worthy of attention at this time. Agreements have accordingly been made by which two experienced grape growers, one near Southern Pines, N. C., and one near Earleton, Fla., have undertaken the testing of large collections of imported vines under the direction of this Division. Their expenditures for labor, fertilizers, spraying materials, etc., are to be reimbursed to them from the appropriation for pomological investigations. One hundred and nineteen varieties grafted on Phylloxera-resistant American stocks have been planted by these experimenters and 43 varieties of "direct producers," "resistant stocks," etc., have also been so planted. These vines were imported by the Section of Seed and Plant Introduction. Other varieties not obtainable last year will be added during the coming winter, so that a thorough and comprehensive test of all the varieties likely to be useful can be made under conditions where fungous diseases can be investigated and combated by spraying or other defensive methods. Both of the growers referred to have conducted experiments along this line in former years with a fair degree of success, and their locations are considered well adapted to *vitis vinifera* and at the same time typical of large regions in the South Atlantic and Gulf States.

Vines of a few selected varieties grafted on resistant roots were placed with individual growers in favorable locations in Florida, North Carolina, Alabama, Louisiana, and Kansas with a view to determining the adaptability of the several localities to the culture of this species.

EXPERIMENTS IN FRUIT EVAPORATION.

Early in the fiscal year prominent exporters of dried fruits in New York and California entered an emphatic protest in the State Department against the action of certain European Governments, notably those of Switzerland and Germany, in prohibiting entrance of unpeeled dried fruits from the United States. This prohibition was alleged to be for the purpose of guarding against the introduction into those countries of the insect known as San Jose scale on such fruits grown in the United States.

This Division having been asked for an opinion on the probability of the introduction of the scale into foreign countries on dried fruit, a negative reply was made by the Acting Pomologist. It was not believed the scale could survive the high temperature and other vicissitudes which accompany the drying process as commonly practiced. This was considered especially true in the case of evaporated fruits, which are subjected to high temperatures for a considerable time in a closed chamber.

The export trade in dried fruits has become so important in recent years and is growing so rapidly at the present time that any unjust prohibitive action, such as the above, on the part of foreign Governments is likely to have a depressing influence upon our fruit industry. There being no record of experiments covering the points in question, a test of the ability of the scale to endure the drying process was

arranged in cooperation with the Entomologist. In a series of experiments several lots of unpeeled peaches, apples, and pears were carried through the drying process both in evaporator and by sun-drying in the open air. Portions of each lot were dried both with and without exposure to the fumes of sulphur for bleaching. In short, every effort was made to duplicate all the possible conditions under which fruit is dried on the ordinary farm. Careful records of temperatures to which the fruit was subjected in the evaporator were kept. It is gratifying to state that upon subsequent examination by an expert under the direction of the Entomologist no living scale was found upon the fruit. Detailed reports of these experiments were furnished the State Department through the Entomologist for use in sustaining our contention that American sun-dried and evaporated fruit is free from any suspicion of harboring living scale insects or transporting them from State to State or to foreign countries.

ROOT-GRAFTING EXPERIMENTS.

The third year of the nursery period of the second comparative test of methods of root-grafting the apple has been completed. As will be observed from the report of last year, the trees retained for the third year were those remaining after removal and measurement of alternate trees in the spring of 1898 from the rows of those grafted and planted for the test in the spring of 1896. The trees were carefully graded and photographed. Owing to injury by woolly aphis, which interfered somewhat with the experiment during the last year, the three-year-old trees were not planted in sets when removed from the nursery, as were those of the two previous years. The detailed results of the three-year nursery period of the experiment are being prepared for publication.

CARD CATALOGUE.

Work on the descriptive catalogue of fruit varieties has been temporarily interrupted by the serious illness of the special agent in charge of that work, Mr. T. T. Lyon, of Michigan. The catalogue of peaches described in standard pomological works, with the addition of a considerable number of varieties recently introduced, of which original descriptions have been prepared by Mr. Lyon, contains nearly 1,500 cards, of which about 500 are distinct varietal names and about 1,000 recognized synonyms. It is desired to complete this catalogue as soon as possible, as the rapidly increasing number of varieties in cultivation makes its general distribution among fruit growers important.

REVISION OF CATALOGUE OF FRUITS.

As noted in the report of last year, the "Catalogue of fruits recommended for cultivation in the various sections of the United States by the American Pomological Society," which was published in 1897 as Bulletin No. 6 of this Division, has been thoroughly revised by a committee of that society working in cooperation with the Division force. Prof. W. H. Ragan, of Indiana, the chairman of the society committee, who has had the work in charge, has been continued during the year as a special agent of this Division. Much of the actual work of revision has been done in Washington, where the libraries and records, as well as the members of the Division force, could be

consulted, with a view to insuring as far as possible the accuracy of the nomenclature and descriptions of the catalogue.

To secure more definite data in regard to the adaptability of varieties on the Pacific slope, Prof. E. J. Wickson, of the University of California, was last year appointed a special agent to conduct a special investigation on the subject among the growers of that region. His report was made the basis of the portion of the catalogue which relates to the fruit districts of that section.

The catalogue has been considerably enlarged, the revised edition containing descriptions of 1,221 varieties against the 1,107 varieties of the earlier edition.

FIELD INVESTIGATIONS.

In addition to the investigation of the status of the European grape in the South Atlantic States by the Assistant Pomologist, as previously mentioned, an extended preliminary investigation of the condition of the fruit industry in Idaho, eastern Oregon, and eastern Washington was made by the Pomologist during the autumn of 1898.

The fruit industry as a commercial enterprise is comparatively new in the above sections, but the precocity and productiveness of the orchards and vineyards visited and the large size, brilliant color, and excellent keeping and shipping quality of the product render the outlook for the commercial fruit grower very promising. Many varieties of apples and pears which are now grown with much difficulty in the Eastern States, because of their susceptibility to injury by disfiguring fungous diseases, grow to great perfection with only ordinary care in the drier climate of the region mentioned.

The nomenclature and identity of varieties is much confused, however, and in this particular this Division can be of distinct service to the growers through the identification of specimens forwarded to Washington City, though more effectually through field investigation.

DAMAGE TO FRUIT TREES AND VINES BY THE FREEZE OF FEBRUARY, 1899.

The unusually low temperature which prevailed over a large part of the country during the month of February, 1899, worked great and permanent injury to the trees and vines of many important fruit-producing sections. Hundreds, and in some cases hundreds of thousands, of trees of varieties that were supposed to be sufficiently hardy to endure the lowest temperatures that were likely to occur were killed outright or greatly damaged.

A correct understanding and interpretation of the relative effects of this freeze upon varieties differing in hardiness will be of great importance to growers in shaping the commercial fruit districts of the future, as well as in determining what varieties may safely be selected for planting therein. A preliminary investigation of these questions by means of circulars of inquiry mailed to more than 2,000 prominent fruit growers was promptly instituted. The response to these inquiries has been gratifyingly large, and, if followed up by prompt field investigation, is expected to yield results of permanent value to both commercial and scientific pomology.

PREPARATION FOR PARIS EXPOSITION.

The work of planning and preparing for installation the exhibit of horticultural products of the United States for the Paris Exposition

of 1900, which was intrusted to this Division, has occupied a considerable portion of the time of both the Pomologist and the Assistant Pomologist during the last half of the fiscal year. As now outlined and in preparation, the exhibit will be made with a view to showing in attractive form such horticultural products of the United States as are likely to be in demand in Europe and can be obtained in large quantities at the present time or in the near future. Canned, dried, and evaporated fruits and vegetables will be shown in great variety. Such fresh fruits and vegetables as are adapted to the export trade will be shown in large quantity. Of fresh fruits, the apple and the orange will be prominent, and of nuts, the pecan and shagbark.

Opportunity will be afforded for the individual grower to exhibit his products in these lines, so far as possible, in competition for awards.

Large collections of photographs of the commercial features of our horticulture, such as seed farms, nurseries, orchards, vineyards, packing houses, canneries, drying grounds, and evaporators, as well as views of landscape work in home grounds, parks, and cemeteries, are being prepared by exhibitors under our direction.

CURRENT WORK.

In addition to the regular work of the Division, which continues much the same from year to year, special attention will be paid to the continuation and enlargement of the European grape-testing experiments already under way.

A large number of choice, described varieties of table grapes are yet to be secured for testing, and in this the Section of Seed and Plant Introduction will cooperate. In the matter of control of fungous diseases the Division of Vegetable Physiology and Pathology, which has already rendered valuable aid in this direction, will be called upon as occasion may require.

The investigation of the effects of the freeze of February upon varieties will be continued, and it is hoped that much-needed field work in this line can be done in several sections during the year.

The details of gathering, storing, and shipping the large quantity of fruit of the crop of 1899 for exhibition at Paris will require careful attention and a considerable expenditure of time and energy.

PLANS FOR THE ENSUING YEAR.

In outlining work to be undertaken during the next fiscal year, I would again call attention to the importance of providing at an early date for a thorough investigation and report upon the pomological resources of the newly acquired islands of Porto Rico and the Hawaiian group. As fruit culture is likely to become an important item in the rural economy of those islands, it is important that the present status of the industry should be determined in order that light may be thrown on its probable future. The question is important not only to the present inhabitants of those islands, but also to a large number of citizens in the Gulf States, Arizona, and California, whose projected fruit-growing enterprises are hampered by the uncertainty in regard to the lines in which competition may be expected from the pomological products of the islands. I therefore again recommend that a thorough investigation of this subject be provided for under the direction of this Division at the earliest practicable date and that a sufficient increase in appropriation be provided to make its accomplishment possible during the coming fiscal year.